

What is claimed is:

- 1        1. A method for facilitating robust revision control of components of a system, the
- 2        method comprising:
  - 3                storing a plurality of system components under revision control in a master
  - 4                repository, according to internal names;
  - 5                storing, under revision control in the master repository, a binding between the
  - 6                internal name of each of the plurality of system components and its
  - 7                corresponding external name;
  - 8                storing, under revision control in the master repository, attributes concerning
  - 9                system components;
  - 10          storing, in the master repository, a journal of operations performed on system
  - 11          components;
  - 12          responsive to a user performing an operation on at least one system component
  - 13          according to its external name, updating the journal accordingly; and
  - 14          responsive to a user indication, updating the revision control system to include a
  - 15          new version of its contents reflecting a change-set of operations consisting
  - 16          of all operations performed by the user on system components since a
  - 17          previous indication from the user.
- 1        2. The method of claim 1 wherein updating the revision control system to include a new
- 2        version of the system components further comprises:
  - 3                reading the journal to determine which operations have been performed by the
  - 4                user on system components since the previous indication from the user;

5 determining the internal names of affected system components;  
6 updating affected system components in the revision control system according to  
7 the user performed operations;  
8 updating the journal to reflect processing of the user indication; and  
9 associating a new version number with a resulting state of the revision control  
10 system.

1 3. The method of claim 2 wherein updating the revision control system to include a new

2 version of the system components further comprises:

3 updating the stored bindings to reflect at least one change to at least one external  
4 name of at least one affected system component made by at least one user  
5 operation.

1 4. The method of claim 2 wherein updating the revision control system to include a new

2 version of the system components further comprises:

3 updating the stored attributes to reflect at least one change to at least one attribute  
4 concerning at least one affected system component made by at least one  
5 user operation.

1 5. The method of claim 2 wherein updating the revision control system to include a new

2 version of the system components further comprises:

3 modifying the affected system components in the master repository to reflect the  
4 performed user operations.

1        6. The method of claim 1 wherein storing a plurality of system components further  
2      comprises:

3                 storing at least one system component from a group of system components  
4                         consisting of:  
5                         a symbolic link;  
6                         a file; and  
7                         a directory.

1        7. The method of claim 1 wherein storing attributes concerning system components  
2      further comprises:

3                 storing at least one attribute concerning at least one system component from a  
4                         group of attributes consisting of:  
5                         a deletion indicator;  
6                         an owner;  
7                         a group;  
8                         a type;  
9                         a version number;  
10                  a mode; and  
11                  security settings.

1        8. The method of claim 1 further comprising:

2                 storing, in the master repository, a indication of a next available internal name;  
3                 and

4                    updating the indication accordingly as internal names are assigned to system  
5                    components.

1                 9. The method of claim 1 further comprising:  
2                    providing at least one user with a user working area, each user working area  
3                    comprising a working copy of the master repository, in which a user can  
4                    perform operations on system components; and  
5                    only providing users access to system components in user working areas,  
6                    according to their external names.

1                 10. The method of claim 9 wherein storing a binding between the internal name a system  
2                    component and its corresponding external name further comprises:  
3                    storing a binding between a constant number used to refer to the system  
4                    component in the revision control system and a variable character string  
5                    used to refer the system component by at least one user, in at least one  
6                    user working area.

1                 11. The method of claim 9 wherein updating the revision control system to include a new  
2                    version of the system components reflecting a change-set further comprises:  
3                    synchronizing the user working area from which the user made the indication with  
4                    the master repository.

1                 12. The method of claim 9 wherein responsive to a user performing an operation on at  
2                    least one system component according to its external name, updating the journal accordingly  
3                    further comprises:

4 updating the journal to indicate that the user has performed an  
5 operation on at least one system component from a group of operations  
6 consisting of:  
7 adding at least one system component to the master repository;  
8 backing a change-set out of the master repository;  
9 changing a group of at least one system component;  
10 changing a mode of at least one system component;  
11 changing an owner of at least one system component;  
12 adding a comment concerning at least one journal entry;  
13 editing at least one system component;  
14 modifying linking information concerning at least one system component;  
15 deleting at least one system component from the master repository;  
16 un-deleting at least one system component in the master repository;  
17 renaming at least one system component; and  
18 undoing at least one earlier performed user operation.

1 13. The method of claim 9 further comprising:

2 responsive to a request from a user in a working area, providing the user with data  
3 from a group of data consisting of:  
4 at least one entered change-set;  
5 differences between two versions of a system component;  
6 information concerning at least one system component;  
7 a location of the user's working area;  
8 a listing of system components currently checked out for editing;

9                   a requested revision of a system component; and  
10                 a path to a root of the master repository.

1       14. The method of claim 9 further comprising:  
2                 responsive to a user request, synchronizing the user working area from which the  
3                 user made the request with the master repository.

1       15. The method of claim 9 further comprising:  
2                 requiring a user to check a system component out of the master repository for  
3                 editing before performing a modifying operation on the system  
4                 component.

1       16. A computer readable medium containing a computer program product for facilitating  
2         robust revision control of components of a system, the computer program product comprising:  
3                 program code for storing a plurality of system components under revision control  
4                 in a master repository, according to internal names;  
5                 program code for storing, under revision control in the master repository, a  
6                 binding between the internal name of each of the plurality of system  
7                 components and its corresponding external name;  
8                 program code for storing, under revision control in the master repository,  
9                 attributes concerning system components;  
10                 program code for storing, in the master repository, a journal of operations  
11                 performed on system components;

12 program code for, responsive to a user performing an operation on at least one  
13 system component according to its external name, updating the journal  
14 accordingly; and  
15 program code for, responsive to a user indication, updating the revision control  
16 system to include a new version of its contents reflecting a change-set of  
17 operations consisting of all operations performed by the user on system  
18 components since a previous indication from the user.

1 17. The computer program product of claim 16 wherein the program code for updating  
2 the revision control system to include a new version of the system components further  
3 comprises:

4 program code for reading the journal to determine which operations have been  
5 performed by the user on system components since the previous indication  
6 from the user;  
7 program code for determining the internal names of affected system components;  
8 program code for updating affected system components in the revision control  
9 system according to the user performed operations;  
10 program code for updating the journal to reflect processing of the user indication;  
11 and  
12 program code for associating a new version number with a resulting state of the  
13 revision control system.

1        18. The computer program product of claim 17 wherein the program code for updating  
2        the revision control system to include a new version of the system components further  
3        comprises:

4                program code for updating the stored bindings to reflect at least one change to at  
5                least one external name of at least one affected system component made  
6                by at least one user operation.

1        19. The computer program product of claim 17 wherein the program code for updating  
2        the revision control system to include a new version of the system components further  
3        comprises:

4                program code for updating the stored attributes to reflect at least one change to at  
5                least one attribute concerning at least one affected system component  
6                made by at least one user operation.

1        20. The computer program product of claim 17 wherein the program code for updating  
2        the revision control system to include a new version of the system components further  
3        comprises:

4                program code for modifying the affected system components in the master  
5                repository to reflect the performed user operations.

1        21. The computer program product of claim 16 further comprising:  
2                program code for providing at least one user with a user working area, each user  
3                working area comprising a working copy of the master repository, in  
4                which a user can perform operations on system components; and

5 program code for only providing users access to system components in user  
6 working areas, according to their external names.

1 22. The computer program product for claim 21 wherein the program code for updating  
2 the revision control system to include a new version of the system components reflecting a  
3 change-set further comprises:

4 program code for synchronizing the user working area from which the user made  
5 the indication with the master repository.

1 23 The computer program product for claim 21 further comprising:  
2 program code for requiring a user to check a system component out of the master  
3 repository for editing before performing a modifying operation on the  
4 system component.

1 24. A computer system for facilitating robust revision control of components of a  
2 system, the computer system comprising:  
3 a software portion configured to store a plurality of system components under  
4 revision control in a master repository, according to internal names;  
5 a software portion configured to store, under revision control in the master  
6 repository, a binding between the internal name of each of the plurality of  
7 system components and its corresponding external name;  
8 a software portion configured to store, under revision control in the master  
9 repository, attributes concerning system components;  
10 a software portion configured to store, in the master repository, a journal of  
11 operations performed on system components;

12           a software portion configured to, responsive to a user performing an operation on  
13           at least one system component according to its external name, update the  
14           journal accordingly; and  
15           a software portion configured to, responsive to a user indication, update the  
16           revision control system to include a new version of its contents reflecting a  
17           change-set of operations consisting of all operations performed by the user  
18           on system components since a previous indication from the user.

1           25. The computer system of claim 24 wherein the software portion configured to update  
2           the revision control system to include a new version of the system components further  
3           comprises:

4           a software portion configured to read the journal to determine which operations  
5           have been performed by the user on system components since the previous  
6           indication from the user;  
7           a software portion configured to determine the internal names of affected system  
8           components;  
9           a software portion configured to update affected system components in the  
10           revision control system according to the user performed operations;  
11           a software portion configured to update the journal to reflect processing of the  
12           user indication; and  
13           a software portion configured to associate a new version number with a resulting  
14           state of the revision control system.

1        26. The computer system of claim 25 wherein the software portion configured to update  
2        the revision control system to include a new version of the system components further  
3        comprises:

4              a software portion configured to update the stored bindings to reflect at least one  
5              change to at least one external name of at least one affected system  
6              component made by at least one user operation.

1        27. The computer system of claim 25 wherein the software portion configured to update  
2        the revision control system to include a new version of the system components further  
3        comprises:

4              a software portion configured to update the stored attributes to reflect at least one  
5              change to at least one attribute concerning at least one affected system  
6              component made by at least one user operation.

1        28. The computer system of claim 25 wherein the software portion configured to update  
2        the revision control system to include a new version of the system components further  
3        comprises:

4              a software portion configured to modify the affected system components in the  
5              master repository to reflect the performed user operations.

1        29. The computer system of claim 24 further comprising:

2              a software portion configured to provide at least one user with a user working  
3              area, each user working area comprising a working copy of the master

4                   repository, in which a user can perform operations on system components;  
5                   and  
6                   a software portion configured to only provide users access to system components  
7                   in user working areas, according to their external names.

1       30. The computer system of claim 29 wherein the software portion configured to update  
2       the revision control system to include a new version of the system components reflecting a  
3       change-set further comprises:

4                   a software portion configured to synchronize the user working area from which  
5                   the user made the indication with the master repository.

1       31. The computer system of claim 29 further comprising:

2                   a software portion configured to require a user to check a system component out  
3                   of the master repository for editing before performing a modifying  
4                   operation on the system component.